

3-31-2021

## Public-Private Partnerships in Transportation Infrastructures: A Tool to Overcome the Post-Covid-19 Economic Crisis in Spain

José-María Rotellar-García  
*Universidad Francisco de Vitoria, josemaria.rotellar@ufv.es*

Mario González-Medrano  
*Universidad Francisco de Vitoria, mario.gonzalez@ufv.es*

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### Recommended Citation

Rotellar-García, José-María and González-Medrano, Mario (2021) "Public-Private Partnerships in Transportation Infrastructures: A Tool to Overcome the Post-Covid-19 Economic Crisis in Spain," *Journal of New Finance*: Vol. 2 : No. 1 , Article 2.

DOI: 10.46671/2521-2486.1012

Available at: <https://jnf.ufm.edu/journal/vol2/iss1/2>

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# Public-Private Partnerships in Transportation Infrastructures: A Tool to Overcome the Post-Covid-19 Economic Crisis in Spain

## Abstract

An indicator of the economic crisis generated by COVID-19, provided by the National Institute of Statistics is the decrease in the numbers of passengers in collective transport and international tourists arriving in Spain in 2020. To overcome this economic crisis, this paper analyzes, by using exploratory research methodology, the implementation of new passenger transportation infrastructures through public-private partnerships. With this approach, it will be possible to mobilize private capital, create jobs, obtain tax return and generate economic activity. We propose that priority actions related to the areas of collective public transport, urban mobility and road safety on conventional roads, should be carried out by the Association of Construction Companies and Infrastructure Concessionaires and the Spanish Association of Engineering, Consulting and Technological Services.

## Keywords

COVID-19, public-private partnerships, infrastructures, transport, financing

## JEL Code

G38, H54, H76, R40, R42

## Submission Date

3-19-2021

## Approval Date

3-26-2021

## Publication Date

3-31-2021

## 1. INTRODUCTION

Commonly referred to simply as “coronavirus”, COVID-19 is an infectious disease caused by the type 2 coronavirus of the acute severe respiratory syndrome (SARS-CoV-2) of the Coronaviridae family. After the appearance of the COVID-19 disease in December 2019 in China and its subsequent spread to the rest of the world, the World Health Organisation (WHO) declared a pandemic on March 11th, 2020. With a major impact on Europe and, especially, Spain, all economic sectors have been affected by the pandemic (WHO, 2020). The measures taken to stop the spread of COVID-19 both by the Government of Spain and by regional administrations have targeted three main areas: the restriction of movement, the limitation of activities and the closure of services (Boletín Oficial del Estado [Official State Gazette] (BOE), 2020a, 2020b).

The COVID-19 disease is a respiratory virus, transmitted through respiratory droplets generated when those infected cough or sneeze. Due to these conditions, public transport systems were considered high-risk environments as they represented the combined risks of large numbers of passengers in spaces with poor ventilation; the difficulty of monitoring infected people and the large number of common surfaces that were being touched (UITP, 2020b). Due to the characteristics of the COVID-19 disease and the restrictions imposed to limit its spread, this article starts by analyzing the impact of the COVID-19 crisis on passenger transport in Spain during the year 2020.

As a tool to overcome the economic crisis of the post-COVID-19 era in Spain, we put forward a series of priority actions related to passenger transport infrastructures in Spain in the areas of collective public transport, urban mobility and road safety on conventional roads. All these actions would be carried out through public-private partnerships (PPPs) to combine the

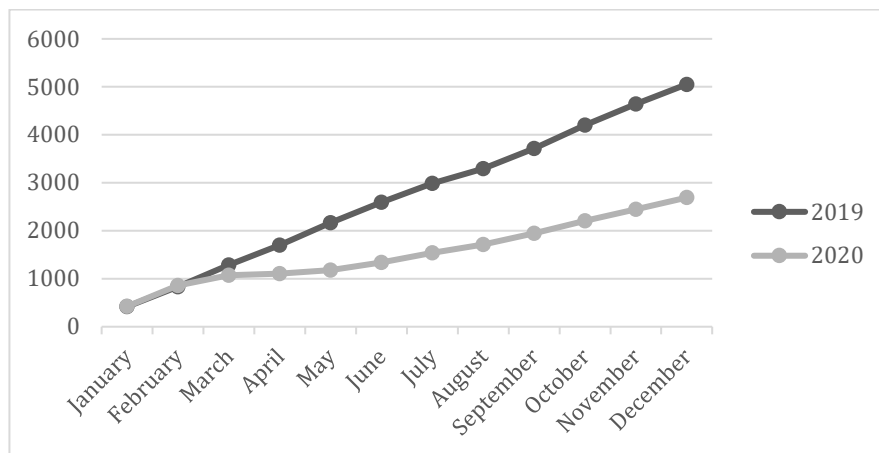
advantages of established transport infrastructures with the efficiency of private capital (Cui, Liu, Hope and Wang, 2018; Pantelias, 2016; Skietrys, Raipa, and Bartkus, 2008).

## **2. IMPACT OF COVID-19 ON TRANSPORT IN SPAIN**

The COVID-19 health crisis has impacted collective passenger transport more than any other form of transport for three main reasons. The first relates to the measures introduced by public administrations to limit or prevent individual mobility. The second arises from the digital transition that many business and educational activities have undergone, leading to a reduction or elimination of physical attendance in the workplace and in educational institutions. Finally, the perception of high risk of infection when traveling by public transport has severely reduced passenger numbers

All these factors have resulted in a decrease in the number of passengers in collective transport. The worst figures coincide with the declaration of the first state of alarm in March 2020 and its successive extensions until June, with April being the most significant month, when the number of travelers fell by more than 91%. As of July, an improvement in the number of users of collective transport begins, continuing until December, with an average reduction rate for the last semester of 2020 of 40%. If we add together the number of passengers for both 2019 and 2020 until December, we find that collective transport underwent a reduction of 2,360.9 million transported passengers, leading to a percentage decrease of 46.7% (BOE, 2020a, 2020b; Instituto Nacional de Estadística [National Institute of Statistics] (INE), 2021d). Graph 1 shows the accumulated monthly number of travelers for the years 2019 and 2020.

Graph 1. Comparison 2019-2020 of accumulated travelers (Millions).



Note: Data from the INE (2021d).

We proceed to analyze the data in greater depth, differentiating by means of transport, as reflected in Table 1. In urban transport, the greatest decrease occurred in the use of the subway, with a reduction of 47.3%. Regarding interurban transport, long distance transportation shows the greatest drops: the high-speed rail service stands out with a reduction of 66% while domestic flights in the peninsula experience a reduction of as much as 67.7%. These figures reflect the mobility restrictions of citizens between different regions. The accumulated variation of passengers between 2019 and 2020 divided by zone and means of transport is presented in Table 1. Thanks to the disaggregation methodology, it is possible to observe that the lowest variations occur in urban areas since the mobility of citizens within their city was rarely restricted. In contrast, mobility restrictions within the same region or at national level were more frequent and continuous. For this reason, the greatest decreases occurred in interurban and long-distance transport. In urban transport, the variations between the different means of transport are similar to those seen in interurban transport (Rogers, Plante, Wong and Evans, 1991).

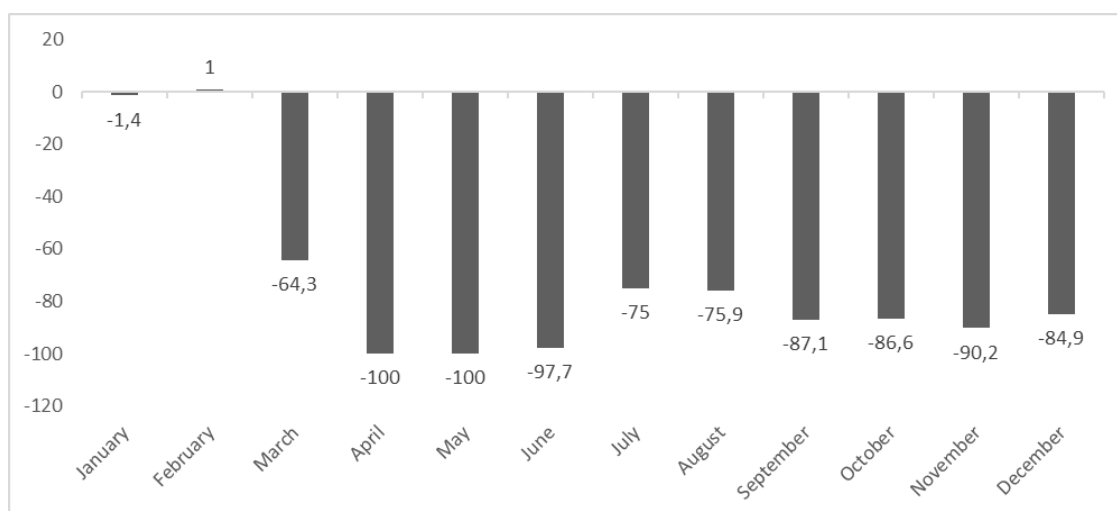
Table 1. Accumulated variation 2019-2020 of passengers in urban and interurban transport

TRANSPORT		VARIATION (%)	
Urban	Subway	-47.3	
	Bus	-44.8	
Interurban	Surroundings	-44.9	
	Bus	Medium distance	-46.0
		Long distance	-61.4
	Railway	Surroundings	-45.8
		Medium distance	-55.6
		High-Speed	-66.0
		Long distance remainder	-64.8
	Aerial (indoor)	Peninsular	-67.7
		Peninsular-Remainder of territory	-58.5
		Inter-island	-46.1
	Maritime (cabotage)	-52.1	

Note: Data from the INE (2021d).

The transport of international tourists also displays its worst figures during the first state of alarm and its extensions, as shown in Graph 2. The most striking decrease occurs in April and May with a reduction of 100% in the number of international tourists. There is a slight improvement, in the second semester of 2020, for the months of July and August. The accumulated annual rate for the years 2019-2020 reflects an overall decrease of 77.3%; that is to say, almost 65 million fewer tourists visited Spain in 2020 (INE, 2021c).

Graph 2. Monthly variation in the arrival of international tourists 2019-2020 (Percentage)



Note: Data from the INE (2021c).

By countries, the largest decreases occurred in citizens of the United States, Ireland and the United Kingdom, compared to the smallest decreases in France, Portugal and Belgium. Table 2 shows the annual variations in the arrival of international tourists according to the country of residence for the year 2020.

Table 2. Arrival of international tourists to Spain in 2020 by country of residence

COUNTRY	NO. OF TRAVELERS	ANNUAL VARIATION (%)
United States	407 437	-87.7
Ireland	329 759	-84.9
United Kingdom	3 173 861	-82.4
Italy	948 389	-79.1
Nordic Countries	1 172 711	-78.8
Germany	2 410 492	-78.4
Switzerland	398 925	-78.0
Netherlands	922 797	-75.0
Belgium	747 016	-70.4
Portugal	762 275	-68.6
France	3 877 619	-65.2

Note: Data from the INE (2021c).

In addition, the entry of tourists according to access route underwent the following variations: port (-85.5%), airport (-80.1%), train (-74.0%) and road (-61.1%) (INE, 2021c). This reflects that those who needed to travel through a collective medium were less likely to visit Spain, realizing that they would be exposed to a high risk of infection on the journey.

The decrease in the number of travelers in collective transport had a direct impact on overnight hotel stays, which fell by 73.3% in 2020. In the case of Spanish residents, there was a decrease of 57.6%, while the decrease in numbers of foreign residents was significantly higher, at 81.7%. Regarding the total number of hotel rooms offered, only 33.7% of them were covered (INE 2021a). This decrease in hotel occupancy also led to a 78.5% decrease in tourist spending by foreign residents, corresponding to 72, 172 million euros less in 2020 compared to 2019 (INE, 2021b). Table 3 summarizes the variations explained in this section regarding international tourists for the years 2019 and 2020.

Table 3. Variation between 2019-2020 in international tourists

CONCEPT	VARIATION (%)
Number of tourists	-77.3
Overnight hotel stays	-81.7
Expense	-78.5

*Note:* Data from the INE (2021a, 2021b, 2021c).

### 3. MEASURES TO WIN BACK TRAVELER CONFIDENCE

Different transport associations, including the Latin American Railway Association (ALAF), American Public Transportation Association (APTA), Community of European Railway and Infrastructure Companies (CER), International Rail Transport Committee (CIT), International Air Transport Association (IATA), International Association of Public Transport (UITP) and the International Union of Railways (UIC), created working groups in order to guide transport operators in the measures they were to take to maintain services within the new



scenario brought about by the COVID-19 pandemic. The main measures were aimed at reducing the probability of transmission of COVID-19. These measures were: the elimination of magazines, brochures, menus, blankets, pillows or headphones from passenger lounges, the use of disposable gloves at ticket control, special cleaning of the areas frequented by travelers, cleaning personnel on board during trips and the provision of protection kits to customers (UIC, 2020b; UITP, 2020b).

Another series of measures was aimed at maintaining the confidence of travelers in collective transport. These measures include: the application of protocols for detecting clients with symptoms during the trip, the reinforcement of the cleaning system or a clear ticket cancellation policy (UIC, 2020b).

The first surveys carried out on passenger transport show a significant change in patterns and behaviors of mobility. These surveys were conducted with samples of up to 14,000 people in Belgium, France, the United States, China and Japan. Their results showed an increase in use of the private car by up to .....These results can be extrapolated and used to allow us to predict the future of mobility in the post-COVID-19 era. The use of the private car will increase up to 93%, public transport will decrease by as much as 43%, travel on foot or by bicycle will increase up to 57% and shared mobility devices will decrease by as much as 50% (UITP, 2020c).

(Another alternative here would be to say, “If we extrapolate from these numbers... we can see the following trends...(as described above) which are nothing short of alarming for the collective transport sector. Certain factors currently suggest that such a future trajectory is probable.(this links to the following paragraph)

These new patterns in transport as a consequence of COVID-19 are caused by the following series of trends that will directly affect mobility, such as: the reduction in the growth of demand for passenger mobility in cities; the increase in electronic commerce; the

transformation of the topology of cities towards multipolarity, in which small self-sufficient communities emerge around the original center of the city, reducing the need to travel regularly; the increase in telecommuting and schedule flexibility; the awareness of travel safety for fear of infection, the adoption of healthier forms of mobility; the evolution of travel patterns; the acceptance of new forms of mobility as part of the system; the consolidation in the market of private mobility actors and the development of intelligent transport systems (UITP, 2020c).

The passenger numbers that existed in 2019, are not expected to be regained until the year 2023 or 2024 (IATA, 2020). Therefore, transport operators are focusing all their activities on regaining trust in collective transport. In fact, customer distrust is misplaced, since only 1.2% of infections occur in public transport. In the case of rail passenger transport, in particular, the probability of infection is 1 for every 11 000 trips, and when using a mask, this drops to 1 for every 20 000 trips (UITP, 2020a). In order to regain passengers and prevent the trends in the post-COVID-19 era from consolidating, transport operators must transmit to citizens the message that collective transport is safe. It is, therefore, necessary that they make known all the protocols that are already being implemented, since there is no one perfect safety measure, but the best method is the combination of several of them. These measures include: temperature controls to confirm the health status of travelers; the use of masks; the use of disinfectant gel; maintaining social distance or improving the ventilation of closed spaces; an increase in the cleaning and disinfection of frequently touched items; the replacement of paper banknotes by electronic payment and the treatment of contaminated waste (UITP, 2020a, 2020b; UIC, 2020a).

From the point of view of the transport company, this entails carrying out temperature controls on travelers, enforcing the mandatory use of a mask during the trip and the provision of disinfectant gel at strategic points. Several measures can be taken to manage social

distancing, including: limiting the number of people at terminals; reorganization of boarding processes; the use of markers to facilitate recognition of the appropriate distance; management of passenger flows and the organization of luggage placement and digitization.. Ventilation in passenger lounges is improved by increasing the maintenance of ventilation systems; a more regular cleaning of filters; an increase of air renewal cycles or the use of ultraviolet light for the disinfection of ventilation elements (UIC, 2020a). Once travelers are aware of the existence of commitment and responsibility on the part of operators and they understand that the risk of infection is practically non-existent, we can hope to return to pre-COVID-19 operating levels.

#### **4. PUBLIC-PRIVATE PARTNERSHIPS**

Once the greater part of the population is vaccinated, we may begin to leave the health crisis behind. At that time, it will be necessary to overcome the economic crisis generated, to a large extent, by limitations to mobility. Transport infrastructures are and must be the stimulus to overcome this crisis, since they bring about economic development, help reduce poverty and inequality, promote job creation, and ensure environmental sustainability, as well as generating a high social return and improving the welfare of the population. The governments of each region are responsible for providing public services and maintaining the infrastructures necessary to do so. In other words, investments in infrastructure are often part of the social pact between governments and citizens (World Bank, 2017). Given the need for a return to budgetary stability and debt reduction, investment in public-private collaboration appears even more essential (Funke, Irwin and Rial, 2013; Raisbeck, Duffield, and Xu, 2010; Willems et al., 2017).

In order to develop these infrastructures, it is necessary to have both the money and the knowledge to carry out the necessary improvements, so an obstacle that public administrations are going to encounter is compliance with budget constraints. When a public administration

lacks either funds or specialist knowledge or wishes to develop the infrastructure in a more efficient way than through traditional contracting, public administrations have the option of carrying out these infrastructure developments through a PPP. This implies that in the post-COVID-19 economic crisis, public administrations will not be able to carry out the development of new infrastructures with purely public financing, but will need the PPP formula to obtain additional financing from private investors.

The sectors in which PPPs are used by public administrations to provide different types of assets or services within their remit include (World Bank, 2017):

- Transport
- Water and waste
- Electricity
- Social and governmental infrastructures (Education, health, prisons, urban regeneration and social housing)

Another very important question is whether local administrators have the knowledge necessary to offer a particular public service: on occasions, this service can only be offered through a PPP. This situation is more likely to occur in developing countries. PPPs also offer the advantage that, they will commonly complete their work within the timeframe and budget agreed, in contrast with traditional public contracts. Furthermore, due to the long-term nature of the PPP contracts, it is ensured that the asset is kept in good condition and in working order. Finally, thanks to the mixed public-private formula, these projects have benefitted from the innovations and efficiency in management provided by the private sector (World Bank, 2017).

#### **4.1. DEFINITION**

Within the scope of PPP we can find multiple definitions, as every PPP contract is different, so we are going to highlight the definitions made by two international institutions.

The first from the World Bank, describes the PPP as:

"A long-term contract between a private party and a governmental entity, to supply an asset or service, in which the private party assumes a significant risk, is responsible for the management and in which remuneration is linked to performance" (World Bank, 2017, p. 5).

The second is from the Organization for Economic Cooperation and Development (OECD):

"An agreement between the State and one or more private partners by virtue of which the private partners provide a service according to modalities that make it possible to reconcile the objectives of the provision pursued by the State and the profit objectives of the private partners, the effectiveness of reconciliation depends on a sufficient transfer of risks to private partners" (OECD, 2008, p. 17).

Thus, a PPP contract involves the private sector and the public sector, between which there is a distribution of the existing risks in the project and during its different phases.

#### **4.2. RISKS**

The main difference between a traditional contract and a PPP, is that project risks must be shared between the public and private parties, with the risks being assumed by whichever party can best manage them. To qualify as a PPP, the private sector must assume a greater number of risks than the public sector.

Usually, risk distribution is based on the private partner being responsible for the design, construction, financing, operation and maintenance, and the public partner taking on risks related to legislative and political changes (European Court of Auditors (ECA), 2018). In

a broader and more detailed way, the main risks faced by a PPP are the following (Booth and Zuluaga, 2020; CAF – Banco de Desarrollo de América Latina [Development Bank of Latin America], 2018):

- Land expropriation risk
- Risk of design
- Risk of construction
- Environmental and social risk
- Risk from additional investments
- Risk of early termination of the contract
- Risk of exploitation
- Income risk
- Demand risk
- Financing risk
- Inflation risk
- Interest rate risk
- Exchange rate risk
- Regulatory risk
- Risk of exceeding operating costss
- Political risk

### 4.3. BENEFITS

Among the benefits offered by PPPs compared to traditional contracting, the following stand out (European PPP Expertise Center (EPEC), 2011, 2015; Rotellar-García, 2019; ECA, 2018; CAF – Banco de Desarrollo de América Latina [Development Bank of Latin America], 2018):

- It combines the best of the public and private sectors, with generalized benefits and increased competitiveness
- Implementation of large projects through a single action
- Through a single contract, several tasks are integrated, such as design, financing, construction, operation and maintenance, allowing an overview of the entire useful life of the project
- Risks are assumed by the party that can best manage them
- Greater compliance with the established budget
- Economic efficiency
- Deeper study of the need for infrastructure
- High quality of service
- Higher quality maintenance
- Completion of the infrastructure on or before schedule
- Design focused on the entire life cycle, which improves maintenance
- Organizational structure that improves management
- Innovative solutions, generating economic and social improvements
- Incentive to reduce long-term infrastructure costs
- Reduction of interface risks between different systems of the infrastructure, by integrating them all in a single contract
- Increase in investment and a greater capacity to meet costs

- Attraction of talent and technology
- Transfer of technical knowledge to the public sector
- Improvement of the selection of projects

#### 4.4. CHARACTERISTICS

Among the features of PPP projects, one of the most differentiating parameters is the contractual duration which usually ranges between 20 and 30 years; others have a shorter lifespan and very few have a duration beyond 30 years. Other characteristic parameters are the assets involved; the functions to be performed by the private party and the way in which the private party is paid. These assets can be classified as *greenfield* or *brownfield*. The term ‘greenfield’, refers to the fact that the asset is newly built. ‘Brownfield’, refers to existing assets that are improved or whose management is transferred to the private party. Regarding the functions performed by the private party, the most common are (World Bank, 2017):

- Design
- Construction or rehabilitation
- Financing
- Operation
- Maintenance

It is common to denote the scope of PPPs by using the acronym in English which describes the functions performed by the private party. An example would be DBFOM, which takes the initial of each of the tasks listed above, but in English: Design, Build, Finance, Operate and Maintain.

Normally, in the management of these contracts, the private party creates a special purpose entity known as SPV (Special Purpose Vehicle) (World Bank, 2017). An SPV can be made up of partners from different fields, such as industrial, financial or construction, among



others. Thus, these partners limit the risks of the parent companies, since the assets and liabilities associated with the project are segregated (CAF – Banco de Desarrollo de América Latina [Development Bank of Latin America], 2018).

#### **4.5. PAYMENT MECHANISM**

The payment mechanism during the operation phase can be summarized in three modalities, which are designed so that the private party receives payment based on its performance:

1. Payment based on availability:
  - A percentage of availability of the infrastructure and service is established, or
  - The number of components that must be available from the asset is established.
2. Payment based on demand, being made based on the number of uses of the asset.
3. Mixed payment based on availability and demand.

Within these modalities, the private party can receive remuneration directly from the user, from the government or from a combination of both, in which case the public administration subsidizes part of the cost incurred by the final user. Depending on the payment method, the shareholders and lenders of the project, must analyze the ability of the public administration to meet the payment schedule and forecast the use of infrastructure for the on-demand payment method (Eurostat, 2016; World Bank, 2017; CAF – Banco de Desarrollo de América Latina [Development Bank of Latin America], 2018).

#### **4.6. STRUCTURE**

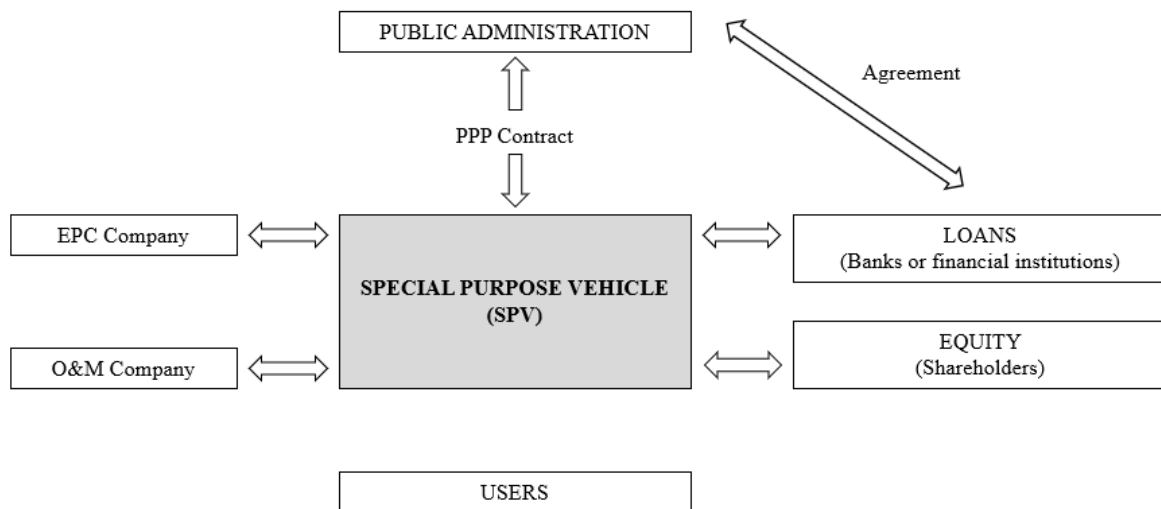
Figure 1 shows a typical contractual structure of a PPP project. In most projects carried out through PPP contracts, an SPV is created. The SPV then obtains financing through a combination of equity and bank debt. The primary contractual relationship is between the

government and the SPV and can be established through a direct agreement between the government, the lenders and the equity investors (World Bank, 2017).

The equity investors, who develop the PPP project and are shareholders in it, are developers, engineering companies, construction companies, infrastructure management companies and private investment funds. Lenders can be commercial banks, development banks, financial institutions, institutional investors such as pension funds and insurance companies (World Bank, 2017).

The SPV carries out the hiring for the design and construction, normally known as Engineering, Procurement and Construction (EPC), and the operation and maintenance (O&M). These contractors are usually affiliates of the equity investors (World Bank, 2017).

Fig. 1. Structure model of a PPP project



*Note:* Data from World Bank (2017) and from the CAF – Banco de Desarrollo de América Latina [Development Bank of Latin America] (2018).

## 5. ACTIONS IN TRANSPORT INFRASTRUCTURES IN SPAIN

This section will detail a series of priority actions related to passenger transport infrastructures in Spain in the areas of collective public transport, urban mobility, and road safety on conventional roads. Transport infrastructures are a critical element in the economic and social development of a country, acting as engines of economic growth, creating employment, generating equilibrium in the balance of payments and high fiscal profitability. They also help modernize and improve the competitiveness of a country, by allowing the number of exports and rate of tourism to increase, and by driving the internationalization of companies in the sector. Additionally, transport infrastructures generate a 30-year social benefit due to time-saving, the reduction of transport system costs and the reduction of external costs such as accidents and polluting gas emissions. All these advantages provided by transport infrastructures will make facing the economic crisis of the post-COVID-19 era possible. Therefore, all actions will detail the creation of employment, the fiscal return and the induced economic activity that will be generated during the period of execution (Asociación de Empresas Constructoras y Concesionarias de Infraestructuras [Association of Construction Companies and Infrastructure Concessionaires] (SEOPAN), 2020; Bénassy-Quéré et al., 2020; Ernst & Young, 2017; SENER and SEOPAN, 2017; SEOPAN and Asociación Española de Empresas de Ingeniería, Consultoría y Servicios Tecnológicos [Spanish Association of Engineering, Consulting and Technological Services] (TECNIBERIA ), 2021).

The impact of the actions on job creation, tax return and economic activity have been calculated as follows. 14 jobs are created for every million euros invested in the construction sector. Tax return stands at 49% for the construction of infrastructures, coming from the reduction of unemployment benefits (10%), increase in social security contributions due to new jobs (9%), tax collection on Value Added Tax (VAT) (21%), collection of personal income tax (known as IRPF - Impuesto sobre la Renta de las Personas Físicas) from employees (3%),

collection of special taxes (3%) and corporate taxes (3%). Finally, with regard to economic activity, for every euro invested in the construction sector, €1.92 of activity is generated in the economy as a whole (SEOPAN and TECNIBERIA, 2021).

All actions are to be carried out through public-private collaboration, due to the improvements this represents compared to traditional public contracting and above all, because of the need for private funds to carry out the projects, due to the period of economic crisis generated by the COVID-19 pandemic. Therefore, each action described details the contribution of public and private funds needed to carry them out.

The actions regarding passenger transport infrastructures in Spain, are detailed below.

### 5.1. COLLECTIVE PUBLIC TRANSPORT

Public transport needs a series of actions to achieve the following objectives: a reduction in the economic costs of the system, a facilitation of intermodality between public transport and private vehicles, a reduction in road congestion in urban and interurban areas, an increase in social benefits for travelers regarding travel times, safety and quality, as well as the reduction of gas emissions and noise pollution. The actions to achieve these objectives would be related to the commuter rail-service and to the subway and tram services (SEOPAN and TECNIBERIA, 2021). Table 4 details the actions taken in collective public transport infrastructures, as well as their investment costs and benefits for society.

Table 4. Actions in collective public transport

<b>ACTION</b>	<b>INVESTMENT (€M)</b>	<b>PRIVATE CAPITAL (€M)</b>	<b>PUBLIC CAPITAL (€M)</b>	<b>CREATION OF EMPLOYMENT (No. PEOPLE)</b>	<b>TAX RETURN (€M)</b>	<b>INDUCED ECONOMIC ACTIVITY (€M)</b>
Commuter Rail	12,701	12,066	635	177,819	6,224	24,387
Subway and tram	12,123	11,517	606	169,728	5,940	23,277

*Note:* Data from SEOPAN and TECNIBERIA (2021).

## 5.2. URBAN MOBILITY

Regarding urban mobility, the expansion of cities has made people dependent on private cars due to the lack of public collective transport in residential areas. This has also led to the co-management of city centers. Two measures are proposed to improve the daily life of citizens in this respect. The first of these is the construction of urban ring roads to improve road traffic management in the accesses to cities. The second is the creation of park-and-ride car parks in the surroundings of these ring roads, in order to allow intermodality with collective transport services when accessing the urban center. Thus, the quality of citizens' lives is improved by the reduction of time and expense in their daily journeys (SEOPAN, 2020; SEOPAN and TECNIBERIA, 2021). Table 5 details the actions in urban mobility infrastructures, as well as their investment costs and benefits for society.

Table 5. Actions in urban mobility

<b>ACTION</b>	<b>INVESTMENT (€M)</b>	<b>PRIVATE CAPITAL (€M)</b>	<b>PUBLIC CAPITAL (€M)</b>	<b>CREATION OF EMPLOYMENT (No. PEOPLE)</b>	<b>TAX RETURN (€M)</b>	<b>INDUCED ECONOMIC ACTIVITY (€M)</b>
Urban ring roads	6,339	5,721	618	88,748	3,106	12,171
Deterrent parking	1,605	1,525	80	22,470	786	3,082

*Note:* Data from SEOPAN and TECNIBERIA (2021).

## 5.3. ROAD SAFETY ON CONVENTIONAL ROADS

The measures implemented to reduce the accident rate in road transport, such as removing points from the driver's license, use of radars, airbags or the Anti-lock Braking System (ABS), have reached their maximum levels of effectiveness. In Spain, between the years 2013 and 2019, the annual number of deaths from traffic accidents was between 1,134 and 1,098. The largest number of fatal accidents, about 78%, occurred on conventional roads, with the costs associated with road accidents with fatalities, amounting to 10,000 million euros annually (SEOPAN, 2020; SEOPAN and TECNIBERIA, 2021).

Therefore, in order to reduce the accident rate, the following two measures are recommended. Firstly, the construction of 2+1 road sections in the conventional network with the construction of a central reservation will facilitate overtaking in sections with two lanes and prevent overtaking in those with a single lane. Secondly, eliminating particularly dangerous sections and obstacles should help to reduce road exit, head-on and side collisions. With these actions, it is estimated that 23 deaths and 71 injuries would be prevented per year, with a hospital saving of 144 million euros (SEOPAN, 2020; SEOPAN and TECNIBERIA, 2021). Table 6 details the required actions in infrastructures to improve road safety on conventional roads, as well as their investment costs and benefits for society.

Table 6. Actions in road safety on conventional roads

<b>ACTION</b>	<b>INVESTMENT (€M)</b>	<b>PRIVATE CAPITAL (€M)</b>	<b>PUBLIC CAPITAL (€M)</b>	<b>CREATION OF EMPLOYMENT (No. PEOPLE)</b>	<b>TAX RETURN (€M)</b>	<b>INDUCED ECONOMIC ACTIVITY (€M)</b>
Road sections 2+1	126	120	6	1,765	62	242
Elimination of specially dangerous sections	604	574	30	8,456	296	1,160

*Note:* Data from SEOPAN and TECNIBERIA (2021).

## 6. CONCLUSION

The COVID-19 disease has generated, a health crisis that has affected European countries, mainly, and in greater proportion, Spain. As a consequence of this health crisis, not yet overcome but which we hope will be surpassed once the entire population is vaccinated, the economic crisis is going to hit, with a major impact on employment.

A first indicator of this economic crisis can be seen from the numbers of passengers using collective transport in 2020, showing reductions of 46.7% overall, while the number of international tourists arriving in Spain, also decreased, this time by 77.3% (INE, 2021a, 2021d). This paper recommends PPPs in passenger transport infrastructures as a tool to overcome this second, economic crisis. Hence, with the implementation of priority actions related to passenger transport infrastructures in Spain, in the areas of collective public transport, urban mobility and road safety on conventional roads, the economic and social benefits shown in Table 7, could be obtained.

Table 7. Economic and social benefits of actions in transport infrastructures

<b>INVESTMENT (€M)</b>	<b>PRIVATE CAPITAL (€M)</b>	<b>PUBLIC CAPITAL (€M)</b>	<b>CREATION OF EMPLOYMENT (No. PEOPLE)</b>	<b>TAX RETURN (€M)</b>	<b>INDUCED ECONOMIC ACTIVITY (€M)</b>
33,498	31,523	1,975	468,986	16,414	64,319

*Note:* Data from SEOPAN and TECNIBERIA (2021).

This would entail an investment of 33,498 million euros, of which only 1,975 million euros would come from the public purse, since, thanks to the PPPs, 31,523 million euros of private capital has been mobilized, that is, 94% of the necessary investment. Without this mobilization of private capital, the Spanish public administrations subject to budgetary restrictions or budgetary compliance, would not be able to carry out these passenger transport infrastructure improvements on public financing alone. Thus, PPPs help mobilize additional

financing for these infrastructures, as they come from private investors. Additionally, social and economic benefits include the creation of 468,986 jobs, a fiscal return of 16,414 million euros and an increased economic activity of 64,319 million euros.

With the social and economic benefits, the advantages generated by PPPs through their actions in passenger transport infrastructure are clear. Furthermore, PPPs will help ensure projects are completed on time and within the initial budget, that the asset is kept in good condition and in working order, and will add to innovation and efficiency in management. However, in order for this formula to become a success, bringing together the best of the public and private sectors, it is necessary that the studies on traffic forecasts are carried out in an independent, rigorous and reliable manner (González-Medrano and García Martín, 2020). To achieve these objectives, , at least 3 traffic forecast studies must be carried out for each new infrastructure by transport consultants who have no organizational relationship with either the public administration or the private investors requesting this study. The most conservative of these three studies would be taken as valid.



## 7. LIST OF ABBREVIATIONS

ABS: Anti-lock Braking System

ALAF: Latin American Railway Association

APTA: American Public Transportation Association

BOE: Boletín Oficial del Estado [Official State Gazette]

CER: Community of European Railway and Infrastructure Companies

CIT: International Rail Transport Committee

ECA: European Court of Auditors

EPEC: European PPP Expertise Center

IATA: International Air Transport Association

INE: Instituto Nacional de Estadística [National Institute of Statistics]

OECD: Organization for Economic Cooperation and Development

PPP: Public-Private Partnership

SARS-CoV-2: Type 2 Coronavirus of the Severe Acute Respiratory Syndrome

SEOPAN: Asociación de Empresas Constructoras y Concesionarias de Infraestructuras  
[Association of Construction Companies and Infrastructure Concessionaires]

SPV: Special Purpose Vehicle

VAT: Value Added Tax

TECNIBERIA: Asociación Española de Empresas de Ingeniería, Consultoría y Servicios  
Tecnológicos [Spanish Association of Engineering, Consulting and Technological Services]

TII: Tax on Income of Individuals

UIC: International Union of Railways (Union Internationale des Chemins de Fer)

UITP: International Association of Public Transport

WHO: World Health Organization

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